

**Chapter 530****SURFACE WATERS TOXICS CONTROL PROGRAM**

**SUMMARY:** The surface waters of the State are managed to prevent contamination from toxic pollutants in toxic amounts in order to meet the goals of the Clean Water Act and Maine's water quality standards. Toxic compounds may not be discharged in amounts that may cause toxic impacts on aquatic organisms or effect human health. This rule sets forth effluent monitoring requirements and procedures to establish safe levels for the discharge of toxic pollutants such that existing and designated uses of surface waters are maintained and protected and narrative and numeric water quality criteria are met.

**1. General Provisions**

**A. Definitions.** The definitions in Chapter 520 are applicable to this Chapter.

**B. Discharge of toxics limited.** No person may discharge any toxic substance in any amount or concentration, either alone or in combination with substances already in the receiving water or discharge, that may cause or contribute to the failure of any classified body of surface water to attain its existing and designated uses or to meet narrative or numeric water quality criteria.

**C. Applications for discharge licenses.** A person filing an application with the Department for a waste discharge license must identify in that application all substances that may be discharged and are toxic or have toxic characteristics. The Department may require a person to conduct additional testing or provide additional information to supplement or amend a license application as necessary to fully characterize an existing or proposed discharge in order to determine the potential for the discharge of toxic substances. This may be in addition to routine testing otherwise required by this rule.

**2. WET Testing and Chemical-Specific Testing for Toxic Pollutants****A. Dischargers subject to this section.**

All licensed dischargers of industrial process wastewater or domestic wastes discharging to surface waters of the State must meet the testing requirements of this section. Dischargers of other types of wastewater are subject to this subsection when and if the Department determines that toxicity of effluents may have reasonable potential to cause or contribute to exceedences of narrative or numerical water quality criteria. For the purposes of this rule, industrial process wastewater is that which comes in contact with or results from a manufactured product, except for those processes that involve only washing and/or packing a raw material without addition of chemicals to the product.

The following dischargers are exempt from testing requirements of this rule unless the Department determines that there is a need for testing based on the nature, location or circumstances of an individual discharge.

- (1) Discharges from individual discharge points licensed to discharge less than 50,000 gallons per day of solely domestic wastewater and with a chronic dilution factor of at least 50 to 1, provided no holding tank wastes containing chemicals are accepted by the facility;
- (2) Discharges from residential overboard discharge systems; or



- (3) Discharges from combined sewer overflow discharge points, provided the owner of the sewerage system is conducting or participating in a discharge abatement program. See Chapter 570, Combined Sewer Overflow Abatement.

**B. Categorization of dischargers.** The basis of this categorization is the relative risk of toxic contamination of receiving water by a discharge. Dilution of the discharge in the receiving water is the primary variable used to determine the testing frequency. In determining dilution for a discharge, the Department shall use the chronic dilution factor as calculated pursuant to section 4(A) of this rule. The Department may assign a discharger to a higher testing frequency level if its outfall configuration or local conditions indicate a disproportional increase in the risk of acute toxic effects.

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| Level I   | Those dischargers having a chronic dilution factor of less than 20 to 1.   |
| Level II  | Those dischargers having a chronic dilution factor of at least 20 but less than 100 to 1.  |
| Level III | Those dischargers having a chronic dilution factor of at least 100 but less than 500 to 1, or dischargers having a chronic dilution factor of more than 500 to 1 and a permitted flow of 1 million gallons per day or greater. |
| Level IV  | Those dischargers having a chronic dilution factor of at least 500 to 1 and a permitted flow of less than 1 million gallons per day.   |

**C. Scope of testing.** Dischargers must conduct testing using the following organisms for Whole Effluent Toxicity (WET) testing and/or chemical tests for specific compounds.

- (1) Marine WET organisms. Test species for discharges to marine waters are Mysid shrimp, *Mysidopsis bahia* (acute only) and the sea urchin, *Arbacia punctulata*, (chronic only), or other organisms specified by the Department. All WET testing must be reported as a No Observed Effect Level.

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NOTE: In estuarine situations, the Department shall specify whether marine or freshwater organisms are best suited for an individual discharge.

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- (2) Freshwater WET organisms. Test species for discharges to freshwater are the water flea, *Ceriodaphnia dubia* and the brook trout, *Salvelinus fontinalis* or other salmonid fish species approved by the Department, or other organisms specified by the Department. All WET testing must be reported as a No Observed Effect Level for both acute and chronic levels for each species.
- (3) "Priority pollutant" testing refers to analysis for levels of priority pollutants listed in Chapter 525, section (4)(VI) in a licensed discharge.
- (4) "Analytical chemistry" refers to a suite of chemical tests for ammonia nitrogen, total aluminum, total cadmium, total chromium, total copper, total hardness (fresh water only), total lead, total nickel, total silver, total zinc, total arsenic, total cyanide and total residual chlorine.
- (5) Chemical analyses for compounds in addition to those referred to in paragraphs (3) and (4) above may be required if the Department has reason to believe that specific discharges contain such compounds in concentrations that may prevent attainment of water quality standards of the waterbody. Additionally, the Department may require testing for other compounds that it identifies as being in use in the State and that pose a risk of causing toxic effects if discharged to the surface waters. Such testing may be



required of specific types or groups of dischargers that may use, produce or receive the compound(s) in question.

- (6) All chemical testing must be carried out by approved methods that permit detection of a pollutant at existing levels in the discharge or that achieve detection levels as specified by the Department. When chemical testing results are reported as less than, or detected below the Department's specified detection limits, those results will be considered as not being present for the purposes of determining exceedences of water quality criteria.
- (7) Whenever WET, priority pollutants and analytical chemistry tests are required during the same time period, all tests must be performed on the same initial sample of effluent.

**D. Test schedules.** In order to characterize a discharged effluent, all dischargers subject to this section must carry out a toxicity testing program consisting of screening tests and surveillance tests according to the schedule set forth in this section. This testing program must be conducted on effluents representative of normal flow, production and operating conditions. All screening and surveillance testing conducted must be reported to the Department and all valid tests will be used to determine compliance with this rule. Where any test demonstrates that a discharge may cause or contribute to an exceedence of a numerical or narrative water quality criterion, additional tests must be conducted pursuant to an approved toxicity reduction program (see section 3(C)). Such testing may not be used to fulfill minimum testing requirements of this section.

- (1) Routine testing requirements. Screening tests must be performed during the 12 months preceding the expiration of a discharger's license, but at least once every five years, unless otherwise directed by the Department in order to accommodate license renewal schedules. During other years, surveillance testing must be conducted. More frequent testing may be required by the Department in order to properly characterize a discharge in consideration of changed conditions or receiving water requirements.

#### Screening level testing

Level	WET Testing	Priority pollutant testing	Analytical chemistry
I	4 per year	1 per year	4 per year
II	2 per year	1 per year	4 per year
III	1 per year	1 per year	4 per year
IV	1 per year *	1 per year *	4 per year *

#### Surveillance level testing

Level	WET Testing	Priority pollutant testing	Analytical chemistry
I	2 per year	None required	4 per year
II	1 per year	None required	2 per year
III	1 per year	None required	1 per year
IV	1 per year *	None required *	1 per year *

\*These routine testing requirements for Level IV are waived, except that the Department shall require an individual discharger to conduct testing under the following conditions.

- (a) The discharger's permit application or information available to the Department indicate that toxic compounds may be present in toxic amounts; or
- (b) Previous testing conducted by the discharger or similar dischargers indicates that toxic compounds may be present in toxic amounts.



Additionally, new or substantially changed dischargers assigned to Level IV must conduct testing during the first two years of the discharge. Further testing is waived provided the testing done does not indicate any reasonable potential for exceedence as calculated pursuant to section 3(E).

- (2) Required testing must be representative of the discharge and any seasonal or other variations, and must be distributed during the year as follows.

Tests per year	Distribution
4	One test each calendar quarter
2	One test in January to June and one test 6 months later. For surveillance tests, different months will be used in 4 successive years.
1	For surveillance tests, different calendar quarters will be used in 4 successive years.

- (3) Reduced testing.

- (a) The Department may reduce testing requirements for dischargers that discharge less than 12 months per year in proportion to the actual number of months discharged, but to not less than one test per year where testing would otherwise be required. The Department may adjust test schedules to provide the most representative sampling program.
  - (b) Dischargers in Levels III and IV may be waived from conducting surveillance testing for individual WET species or chemicals provided that testing in the preceding 60 months does not indicate any reasonable potential for exceedence as calculated pursuant to section 3(E).
  - (c) Dischargers in Level II may reduce surveillance testing to one WET or specific chemical series every other year provided that testing in the preceding 60 months does not indicate any reasonable potential for exceedence as calculated pursuant to section 3(E).
  - (d) Dischargers in Level I may reduce surveillance testing to one WET or specific chemical series per year provided that testing in the preceding 60 months does not indicate any reasonable potential for exceedence as calculated pursuant to section 3(E).
- (4) All dischargers having waived or reduced testing must file statements with the Department on or before December 31 of each year describing the following.
- (a) Changes in the number or types of non-domestic wastes contributed directly or indirectly to the wastewater treatment works that may increase the toxicity of the discharge;
  - (b) Changes in the operation of the treatment works that may increase the toxicity of the discharge; and
  - (c) Changes in industrial manufacturing processes contributing wastewater to the treatment works that may increase the toxicity of the discharge.
- (5) Waiver or Reduction of Testing of Industrial Discharges. The Department may waive or reduce testing or replace testing with requirements adequate to characterize the toxicity of identified pollutants when a discharger provides information adequate to:



- (a) Identify all toxic pollutants present or demonstrate that no toxic pollutants are used in its processes in toxic amounts;
- (b) Demonstrate that chemicals used in or formed by the discharger's industrial processes are not known or suspected to result in the formation of toxic pollutants in toxic amounts; and
- (c) Demonstrate the discharger does not process or treat waters known or suspected to contain toxic pollutants.

3. **Water Quality-based Effluent Limits for Waste Discharge Licenses.** The Department shall establish appropriate discharge prohibitions, effluent limits and monitoring requirements in waste discharge licenses if a discharge contains pollutants that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an ambient excursion in excess of a numeric or narrative water quality criteria or that may impair existing or designated uses. The licensee must also control whole effluent toxicity (WET) when discharges cause, have a reasonable potential to cause, or contribute to an ambient excursion above the narrative water quality criteria. In determining if effluent limits are required, the Department shall consider all information on file and effluent testing conducted during the preceding 60 months. However, testing done in the performance of a Toxicity Reduction Evaluation (TRE) approved by the Department may be excluded from such evaluations.

**A. Specific pollutant approach.** When specific toxic pollutants of known action and interaction are identified in a discharge or potential discharge, the water quality-based effluent limit is determined by use of the applicable numerical water quality criteria for the pollutants to protect aquatic life and human health and using the appropriate dilution described in section 4(A) below.

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NOTE: See section 4(F) for procedures to address multiple discharges into a common receiving water.

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**B. Whole effluent approach.** When the existing or proposed discharge contains two or more pollutants whose actions or interactions are unknown or when toxic components cannot be identified, WET effluent limits may be required for the protection of aquatic life. Whole effluent toxicity limits are the "acute no observed effect level" (A-NOEL) and the "chronic no observed effect level" (C-NOEL), expressed as percent effluent (the mathematical inverse of the applicable dilution factor), and must be greater than the actual receiving water concentrations (percent of effluent in receiving water at the appropriate dilution pursuant to section 4(A)).

**C. Determination of Exceedence of Criteria.** The results of all testing required by this rule must be submitted to the Department not later than the next discharge monitoring report required by the discharger's license, provided, however, that the discharger may review the toxicity reports for up to 10 business days of their availability before submitting them. Using information and guidance provided by the Department, dischargers shall evaluate test results being submitted and identify to the Department possible exceedences of applicable water quality criteria. The Department shall review all testing data as received. If these data indicate that the discharge is causing an exceedence of applicable water quality criteria, then: (1) the licensee must, within 45 days of becoming aware of an exceedence, submit a TRE plan for review and approval and implement the TRE after Department approval; and (2) the Department must, within 180 days of the Department's written approval of the TRE plan, modify the waste discharge license to specify effluent limits and monitoring requirements necessary to control the level of pollutants and meet receiving water classification standards. Evaluations of the reasonable potential for exceedence of criteria must be conducted upon



any license action, following the provisions of section 3(E). The Department shall utilize mass discharge criteria for evaluating individual exceedences of specific chemical pollutants.

When considering the need for license limits, the Department may exclude from evaluations tests in a series done for an individual pollutant or WET test during five years only if the discharger satisfactorily demonstrates through implementation of a TRE pursuant to this subsection that the cause(s) for a high result have been identified and corrected. Additionally, tests subsequent to the high test(s) must not show reasonable potential for exceedence of water quality criteria. In making these determinations, the Department shall not exclude tests solely because the values are higher than other values obtained by the discharger. The Department shall issue a license limit in situations where an exceedence is recorded due to a valid test and a cause for the exceedence cannot be identified and corrected.

**D. Expression of effluent limits.** Where the need for effluent limits has been determined, limits derived from acute water quality criteria must be expressed as daily maximum values. Limits derived from chronic or human health criteria must be expressed as monthly average values.

- (1) For specific chemicals, effluent limits must be expressed in total quantity that may be discharged and in effluent concentration. In establishing concentration, the Department may increase allowable values to reflect actual flows that are lower than permitted flows and/or provide opportunities for flow reductions and pollution prevention provided water quality criteria are not exceeded. With regard to concentration limits, the Department may review past and projected flows and set limits to reflect proper operation of the treatment facilities that will keep the discharge of pollutants to the minimum level practicable.
- (2) WET test effluent limits must be expressed as the maximum percent effluent that will not cause observable adverse effects on test organisms.

**E. Determination of Reasonable Potential to Exceed Receiving Water Quality Criteria.** For effluent monitoring data and the variability of the pollutant in the effluent, the Department shall apply the statistical approach in Section 3.3.2 and Table 3-2 of USEPA's "Technical Support Document for Water Quality-Based Toxics Control" (USEPA Publication 505/2-90-001, March, 1991, EPA, Office of Water, Washington, D.C.) to data to determine whether water-quality based effluent limits must be included in a waste discharge license. Where it is determined through this approach that a discharge contains pollutants or WET at levels that have a reasonable potential to cause or contribute to an exceedence of water quality criteria, appropriate water quality-based limits must be established in any licensing action.

**F. Procedures for data analysis and effluent limit calculations.**

- (1) When a test result for a specific chemical is reported as not found in concentrations at a detection level specified by the Department pursuant to section 2(C)(6), the compound must be considered to be not present for the purposes of determining exceedences of water quality criteria.

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NOTE: Concentrations of compounds detected below levels specified by the Department must still be reported.

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- (2) When the no observed effect level in a WET test is reported as being below the lowest dilution of effluent tested, the effluent is considered to be in exceedence of water quality criteria.



- (3) When all results are reported as below a detection level specified by the Department, the compound must be considered to have no reasonable potential to exceed water quality criteria. For the purposes of determining the coefficient of variation in calculating reasonable potential to exceed water quality criteria pursuant to section 3(E), when some results are reported as below a detectable amount, those values must be considered to be present at a level of one half of the detection level specified by the Department.
- (4) Flows used in calculations are to be governed by the following. For exceedence determinations with specific chemicals, calculations must be based on the facility's flow on the day the sample was collected for acute criteria and the monthly average flow for the chronic and human health criteria. Allowable discharge quantities must be calculated based on the facility's licensed flow and the appropriate design stream flow and water quality criteria. In situations where a discharger's flow augments the stream flow (as is the case with most POTW's), the Department's calculation of allowable mass limits must reflect the differences in dilution factors resulting from actual flows being less than the facility's full license amount. For determination of WET test exceedences and all reasonable potential determinations, the discharger's licensed flow must be used.

4. **Water Quality Based Limit Derivation.** Water quality based limits must be developed by using the following procedures.

**A. Calculation of dilution factors.** A simple dilution model using design stream flows specified in this section must be used to determine allowable effluent limits unless there is information that makes another model approved by the Department more appropriate. All substances are assumed to be persistent in the environment. With a non-continuous discharge (such as a lagoon which can be impounded or a continuous discharge prohibited from discharging under specified conditions), the dilution factors can be based on a guaranteed minimum stream flow or tidal stage below which a discharge will not occur. The discharger must submit a request for a license modification that reflects a different minimum stream flow. If the Department approves an alternate stream flow, the license must include a monitoring and reporting requirement, and must include an accurate means of measuring stream flow that is calibrated annually.

- (1) Dilution factors (DF) for freshwater discharges are calculated using the following models:

- (a) If the entire water supply that ultimately makes up the effluent flow ( $Q_e$ ) is taken from the receiving water upstream of the location from which the stream design flow ( $Q_r$ ) is calculated or measured, then:

$$DF = Q_r / Q_e$$

- (b) If the water supply is comprised of water taken from the receiving water ( $Q_w$ ) and/or from another location ( $Q_o$ ), then:

$$DF = (Q_r + Q_o) / (Q_w + Q_o)$$

- (2) For estuaries where tidal flow is dominant and marine discharges, dilution factors are calculated as follows. These methods may be supplemented with additional information such as current studies or dye studies.



- (a) For discharges to the ocean, dilution must be calculated as near-field or initial dilution, or that dilution available as the effluent plume rises from the point of discharge to its trapping level, at mean low water level and slack tide for the acute exposure analysis, and at mean tide for the chronic exposure analysis using appropriate models determined by the Department such as MERGE, CORMIX or another predictive model.
- (b) For discharges to estuaries, dilution must be calculated using a method such as MERGE, CORMIX or another predictive model determined by the Department to be appropriate for the site conditions.
- (c) In the case of discharges to estuaries where tidal flow is dominant and marine waters, the human health criteria must be analyzed using a dilution equal to three times the chronic dilution factor.

**B. Stream design flows.** For estuaries where tidal flow is not dominant and fresh waters, stream design flows used in the analyses of dilution factors from dilution models must be consistent with the exposure of the population at risk to any and all toxic pollutants. In situations where an island, channel or other physical circumstance divides the flow of a stream, the Department shall use appropriate adjustments or assumptions that best describe that particular situation.

- (1) Analyses using numerical acute criteria for aquatic life must be based on 1/4 of the 1Q10 stream design flow to prevent substantial acute toxicity within any mixing zone and to ensure a zone of passage of at least 3/4 of the cross-sectional area of any stream as required by Chapter 581. Where it can be demonstrated that a discharge achieves rapid and complete mixing with the receiving water by way of an efficient diffuser or other effective method, analyses may use a greater proportion of the stream design flow, up to and including all of it, as long as the required zone of passage is maintained. Flows that allow bioaccumulation of compounds to levels that are toxic, carcinogenic, mutagenic or teratogenic are not to be used in setting effluent limits.
- (2) Analyses using chronic criteria for aquatic life must be based on 7Q10 stream design flow.
- (3) Analyses using human health criteria must be based on harmonic mean or other stream flows consistent with the duration of exposure.

**C. Background concentrations.** The background concentration of specific chemicals must be included in all calculations using the following procedures. The Department may publish and periodically update a list of default background concentrations for specific pollutants on a regional, watershed or statewide basis. In doing so, the Department shall use data collected from reference sites that are measured at points not significantly affected by point and non-point discharges and best calculated to accurately represent ambient water quality conditions. The Department shall use the same general methods as those in section 4(D) to determine background concentrations. For pollutants not listed by the Department, an assumed concentration of 10% of the applicable water quality criteria must be used in calculations. Alternatively, dischargers may provide the Department with site specific information of the same nature to supplement or replace the foregoing values. Sampling plans and/or other means of developing site-specific information must be approved in writing in advance by the Department, and must be consistent with the concepts described in section 4(D), below.



**D. Site-specific adjustments for local conditions.** The Department may use available information to evaluate physical and chemical characteristics of a specific receiving water and adjust calculations of the degree to which they influence the relative toxicity of individual pollutants in that situation. The information may include tests conducted by the Department, the discharger or another organization, provided that approved methods are used for sample collection and analysis. Once being accepted by the Department as valid data, this information may be used in place of the assumptions used to develop statewide water quality criteria for the effected pollutants and discharger.

- (1) While the Department may require or allow different sampling procedures best designed to provide relevant and meaningful information in specific situations, sampling plans must generally include collection of receiving water samples at appropriate locations at least once a month for a period of a year. Samples for temperature, pH and salinity must be collected at a point directly upstream or up current of the discharge. Samples for hardness or other characteristics must be collected at a point upstream in the receiving water not significantly influenced by point source or non-point source discharges that may affect the characteristic in question.
- (2) If a discharger wishes to have its effluent evaluated using water quality criteria expressed as dissolved metal instead of total metal, it may submit to the Department supporting test information. Upon finding the information appropriate and complete, the Department shall use that information to develop a translator value following guidance provided by EPA ("The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit From a Dissolved Criterion, USEPA publication 823-B-96-007, June 1996, EPA, Office of Water, Washington DC,). The testing done must include samples of the effluent and receiving water mixed in proportion to the discharger's dilution factor and analyzed for total and dissolved metal, and samples designed to evaluate the impact of loadings of total metal to receiving water system.

In evaluating information submitted, the Department shall use the combination of chemical characteristics, stream flows and times of the year that best represent the most critical or sensitive conditions for assessment of toxic impacts by specific pollutants.

**E. Water quality reserve.** In allocating assimilative capacity for toxic pollutants, the Department shall hold a portion of the total capacity in an unallocated reserve to allow for new or changed discharges and non-point source contributions. The unallocated reserve must be reviewed and restored as necessary at intervals of not more than five years. The water quality reserve must be not less than 15% of the total assimilative quantity. The Department may increase this amount where it has information that significant non-point sources of a pollutant are present in a watershed. The Department may allocate quantities held in water quality reserve to new or changed dischargers according to the principles of the State's anti-degradation policy described in 38 MRSA, section 464(4)(F).

**F. Effect of multiple discharges.** Where there is more than one discharge into the same fresh or estuarine receiving water or watershed, the Department shall consider the cumulative effects of those discharges when determining the need for and establishment of the level of effluent limits. The Department shall calculate the total allowable discharge quantity for specific pollutants, less the water quality reserve and background concentration, necessary to achieve or maintain water quality criteria at all points of discharge, and in the entire watershed. The total allowable discharge quantity for pollutants must be allocated consistent with the following principles.



- (1) Watershed-wide determinations of the total allowable discharge quantity, allocations to dischargers and the water quality reserve amount must be updated at intervals of not more than five years. The results of updated allocations will be made available to interested parties for comment.
  - (2) Evaluations must be done for individual pollutants of concern in each watershed or segment to assure that water quality criteria are met at all points in the watershed and, if appropriate, within tributaries of a larger river.
  - (3) The total assimilative capacity, less the water quality reserve and background concentration, may be allocated among the discharges according to the past discharge quantities for each as a percentage of the total quantity of discharges, or another comparable method appropriate for a specific situation and pollutant. If there is a need to reduce past discharge quantities, the Department may exclude *de minimus* discharges and for remaining discharges establish necessary reductions and effluent limits with proportional consideration of such factors as each facility's relative size and concentration of pollutants. Past discharges of pollutants must be determined using the average concentration discharged during the past five years and the facility's licensed flow. Where insufficient discharge data exist to accurately characterize a discharge, or for new discharges, the Department shall use an effluent concentration representative of similar discharges. For effluent concentrations reported as non-detectable, the concentration must be taken as one-half of the detection level specified by the Department.
  - (4) When calculating past discharge loads for use in this section, the Department may exclude data that represent improper control of pollutants, are non-representative of a discharge or violate the established effluent limits or water quality limits as calculated on an individual discharge basis for the facility.
  - (5) The amount of allowable discharge quantity may be no more than the past discharge quantity calculated using the statistical approach referred to in section 3(E), but in no event may allocations cause the water quality reserve amount to fall below the minimum referred to in 4(E). Any difference between the total allowable discharge quantity and that allocated to existing dischargers must be added to the reserve.
  - (6) The total allowable discharge quantity must be set to assure compliance with water quality criteria in downstream estuarine and marine waters.
  - (7) In conducting evaluations, the Department shall use the same background concentrations and other receiving water characteristics for all discharges in an affected segment. (Adjustments made pursuant to sections 4(C) or 4(D) may be developed in a common effort and applied to all dischargers in the affected segment.)
5. **WET Testing Procedures.** Toxicity tests must be conducted by an experienced laboratory approved by the Department. The laboratory must follow the procedures described in the following USEPA methods manuals, except as modified by the Department on a case by case basis or as described in this section for the Salmonid Survival and Growth Test.

**A. EPA Methods Manuals**

U.S. Environmental Protection Agency. 2002. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 5<sup>th</sup> ed. EPA 821-R-



02-012. U.S. Environmental Protection Agency, Office of Water, Washington, D.C., October 2002 (the acute method manual)

U.S. Environmental Protection Agency. 2002. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, 4<sup>th</sup> ed. EPA 821-R-02-013. U.S. Environmental Protection Agency, Office of Water, Washington, D.C., October 2002 (the freshwater chronic method manual)

U.S. Environmental Protection Agency. 2002. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, 3<sup>rd</sup> ed. EPA 821-R-02-014. U.S. Environmental Protection Agency, Office of Water, Washington, D.C., October 2002 (the marine chronic method manual)

**B. Salmonid Survival and Growth Test.** The Salmonid survival and growth test must follow the procedures for the fathead minnow larval survival and growth tests detailed in USEPA's freshwater acute and chronic methods manuals (see references above) with the following modifications:

Species - Brook Trout, *Salvelinus fontinalis*, or other salmonid approved by the Department.

Age - Less than six months old for the first test each year and less than twelve months for subsequent tests.

Size - The largest fish must not be greater than 150% of the smallest.

Loading Rate - < 0.5 g/l/day

Feeding rate - 5% of body weight 3 times daily (15%/day)

Temperature -  $12^{\circ} \pm 1^{\circ}\text{C}$

Dissolved Oxygen - 6.5 mg/l, aeration if needed with large bubbles (> 1 mm diameter) at a rate of <100/min

Dilution Water - Receiving water upstream of discharge (or other ambient water approved by the Department)

Dilution Series - A minimum of 5 effluent concentrations (including the instream waste concentrations bracketing acute and chronic dilutions calculated pursuant to Section D); a receiving water control; and control of known suitable water quality

Duration - Acute = 48 hours  
- Chronic = 10 days minimum

Test acceptability - Acute = minimum of 90% survival in 2 days  
- Chronic = minimum of 80% survival in 10 days; minimum growth of 20 mg/gm/d dry weight in controls, (individual fish weighed, dried at 100°C to constant weight and weighed to 3 significant figures)



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